

Appl. No. 10/606,118
Preliminary Amdt. dated May 5, 2004

Amendments to the Specification:

Please add the following paragraph to the beginning of the specification:

This is a continuation of U.S. patent application Serial No. 09/637,344, filed August 11, 2000, which has been abandoned.

Please replace the paragraphs beginning on page 2, at line 17, with the following rewritten paragraphs:

The flashlight 10 is configured with a first rubber o-ring 50 conformingly received between the lens 12 16 and the front end 32 of the front housing portion 12, to form a watertight seal over the forward-facing orifice 30. Likewise, the flashlight 10 is configured with a rubber cap 52 conformingly received between the lens switch assembly 20 and the rear end 46 of the rear housing portion 22, to form a watertight seal over the rearward-facing orifice 44. Additionally, the flashlight is configured with a second o-ring 54 between the rear end 36 of the front housing portion and the front end 42 of the rear housing portion 22, forming a watertight seal between the front and rear housing portions. Thus, the housing (i.e., the combined front and rear housing portions) is watertight.

With reference to FIGS. 4A, 4B and 5, the illuminator assembly 16 has a high-power, white LED 60. Preferably the LED is the only light source in the flashlight, as preferably no bulb is present. The LED has a filament 62 that produces rays of light when energized. The LED also has a built-in, parabolic micro-reflector 63 that directs a significant portion (preferably more than 50%) of the filament's light rays in a divergent beam 64 from a vertex point through a transparent tip 66 of the LED over a directivity angle 68, preferably of 20 degrees. The vertex point is normally the location of the filament. Preferably around 10% of the light from the filament is emitted directly into the divergent beam without first reflecting off the micro reflector.

Appl. No. 10/606,118
Preliminary Amdt. dated May 5, 2004

A preferred LED is the High-power White LED, NSPW500BS, by NICHIA CORPORATION of Japan. It includes stoppers to aid in positioning the LED, and has a preferred electrical and optical characteristics, as well as preferred light directivity. The characteristics of the High-power White LED, NSPW500BS, by NICHIA CORPORATION are depicted in FIG. 8.

With reference to FIG. 6A and 6B, the lens 14 is a transparent body having a circular flat portion 80 surrounding a concentric, circular, convergent-lens portion 82. The convergent-lens portion forms a biconvex lens having a focal point 84 on each side of the convergent-lens portion, each focal point being a focal distance away from a focal center point 86 of the convergent-lens portion. A flange 88 surrounds the flat portion 80, adding rigidity to the lens in the vicinity where it will compress the first o-ring 50 against the forward end 32 of the front housing portion 12 (see, FIG. 2). Preferably the lens is made of acrylic plastic by injection molding.

As depicted in FIGS. 2 and 7A, besides the LED 60, the illuminator assembly 16 includes a flange 90, a parabolic portion 92, support legs 94, and a printed circuit board 96 ~~mounting~~ associated circuitry 98 configured to make the LED compatible with battery power levels that are available in the flashlight. A parabolic inner face 100 of the parabolic portion 92 is a reflective, preferably mirror-like surface, having a focal point. Likewise, an inner face 102 of the illuminator assembly's flange 90 is a reflective, preferably mirror-like surface.